

10/771,402

359/694

IN THE CLAIMS

4/22/05

Upon entry of the present amendment, the status of the claims will be as is shown below. This listing of claims replaces all previous versions and listings of claims in the present application.

1. (Currently Amended) A lens barrel comprising:

a holder which holds an image pick-up device;

a stationary barrel which includes a female helicoid formed on an inner peripheral surface thereof;

a gear/helicoid ring which includes an annular rib formed on outer peripheral surface of said gear/helicoid ring at a rear end thereof, a male helicoid formed on said annular rib and engaged with said female helicoid of said stationary barrel, and a spur gear, wherein teeth of said spur gear are formed on each thread of said male helicoid; and

a driving pinion which is engaged with said spur gear;

wherein a rotation of said gear/helicoid ring via rotation of said driving pinion causes ~~said~~ a lens group to move along ~~said~~ an optical axis,

wherein at least a portion of a rear end of said male helicoid, on threads of which said teeth of said spur gear are formed, extends rearwards to serve as a rear extension portion, and

wherein at least a portion of said rear extension portion overlaps said holder in ~~said~~ an optical axis direction when said gear/helicoid ring firstly retracts while rotating, and subsequently stops retracting at a predetermined position.

2. (Original) The lens barrel according to claim 1, wherein one of opposite end surfaces of said rear extension portion in a circumferential direction of said

Ch. 9. 10/771,402

gear/helicoid ring extends obliquely rearwards on an extension of a root between two adjacent threads of said male helicoid, and

wherein the other of said opposite end surfaces of said rear extension portion extends parallel to said teeth of said spur gear.

3. (Original) The lens barrel according to claim 1, wherein a cutout portion is formed on said holder so that a surface of said rear extension portion comes into contact with one of opposite edges of said cut out portion of said holder in a circumferential direction of said holder in the case where said gear/helicoid ring accidentally retracts beyond said predetermined position.

4. (Currently Amended) The lens barrel according to claim 1, further comprising:

a moving ring which supports said lens group and includes at least one cam follower,

wherein at least one cam groove in which said cam follower is engaged is formed on said gear/helicoid ring.

5. (Original) The lens barrel according to claim 1, wherein said holder is fixed to a rear end surface of said stationary barrel.

6. (Currently Amended) The lens barrel according to claim 1, wherein said driving pinion is elongated in a direction parallel to said optical axis.

7. (Original) The lens barrel according to claim 4, wherein said moving ring is linearly guided along said optical axis without rotating.

8. (Original) The lens barrel according to claim 1, wherein said lens barrel comprises a zoom lens barrel; and

wherein said lens group comprises a focal length varying lens group.

9. (Original) The lens barrel according to claim 1, further comprising:

a linear guide ring provided around said gear/helicoid ring, and linearly guided along <sup>said</sup> ~~an~~ optical axis without rotating, said linear guide ring guiding at least one lens group along said optical axis;

a circumferential groove which is formed on an outer peripheral surface of said gear/helicoid ring adjacent to and in front of said annular rib; and

a plurality of bayonet lugs which project from a rear end of said linear guide ring to be engaged in said circumferential groove so that said gear/helicoid ring and said linear guide ring move together in said optical axis direction while allowing said gear/helicoid ring to rotate freely relative to said linear guide ring.

10. (Currently Amended) A lens barrel comprising:

a stationary <sup>11</sup> barrel which includes a female <sup>11a</sup> helicoid formed on an inner peripheral surface thereof;

a gear/helicoid ring which includes an annular rib formed on an outer peripheral surface of said gear/helicoid ring at a rear end thereof, a male helicoid formed on said annular rib and engaged with said female helicoid of said stationary barrel, and a spur gear, wherein teeth of said spur gear are formed on each thread of said male helicoid;

a pinion driven at a fixed position, and engaged with said spur gear;

a linear <sup>14</sup> guide ring provided around said gear/helicoid ring, and linearly guided along an optical axis without rotating;

a circumferential groove which is formed on ~~an~~ the outer peripheral surface of said gear/helicoid ring immediately in front of said annular rib; and

a plurality of bayonet lugs which project from a rear end of said linear guide ring to be engaged in said circumferential groove so that said gear/helicoid

ring and said linear guide ring move together in said an optical axis direction while allowing said gear/helicoid ring to rotate freely relative to said linear guide ring,

wherein a rotation of said gear/helicoid ring via rotation of said pinion causes at least one lens group, which is linearly guided along said optical axis via said linear guide ring, to move along said optical axis,

wherein a cutout portion is formed on a rear end of said annular rib wherein a rear end of at least one thread of said male helicoid is cut out along both a root between two adjacent threads of said male helicoid and a root between two adjacent teeth of said spur gear, and

wherein an element of said lens barrel enters said cutout portion when said gear/helicoid ring retracts to a rear moving limit thereof.

11. (Currently Amended) The lens barrel according to claim 9, further comprising:

a holder which holds an image pick-up device and includes a stop projection,

wherein said rear moving limit of said gear/helicoid ring is determined by engagement of said stop projection with a stop surface which is formed on said annular rib in said cutout portion to extend along said root between two adjacent teeth of said spur gear.

12. (Currently Amended) The lens barrel according to claim 9, further comprising:

a moving ring which supports said lens group and includes at least one cam follower,

wherein at least one cam groove in which said cam follower is engaged is formed on said gear/helicoid ring.

13. (Original) The lens barrel according to claim 9, wherein said holder is fixed to a rear end surface of said stationary barrel.

14. (Original) The lens barrel according to claim 9, wherein said pinion is elongated in a direction parallel to said optical axis.

15. (Currently Amended) The lens barrel according to claim 11, wherein ~~said~~ a moving ring is linearly guided along said optical axis without rotating.

16. (Original) The lens barrel according to claim 9, wherein said lens barrel comprises a zoom lens barrel; and

wherein said lens group comprises a focal length varying lens group.

17. (Canceled)